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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/830,215	04/24/2001	Akira Kubota	IPE-004	3140

20374 7590 11/10/2003

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EXAMINER	
UHLIR, NIKOLAS J	
ART UNIT	**PAPER NUMBER**
1773	9

DATE MAILED: 11/10/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

CL09

Office Action Summary	Application No.	Applicant(s)	
	09/830,215	KUBOTA ET AL.	
	Examiner	**Art Unit**	
	Nikolas J. Uhlir	1773	

-- The MAILING DATE of this communication appears on the cover sheet with th correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 August 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language.provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

1. This office action is in response to the amendment/arguments dated 8/21/03. Applicant's amendments to the title, specification, and abstract are sufficient to overcome the prior objections. Accordingly, these objections are withdrawn. Further, applicant's amendment/arguments with respect to claims 17 and 20-21 are sufficient to overcome the prior 35 U.S.C 112 2nd paragraph rejections. Accordingly, these rejections are withdrawn. Finally, applicant's arguments with respect to the fact that average surface roughness does not necessarily provide information about the height of protuberances are persuasive. As all of the prior art rejections rely on this contention, they are deemd to be untenable and are hereby withdrawn. However, the case is not in condition for allowance in lieu of the new grounds of rejection cited below.

Claim Rejections - 35 USC § 103

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claim 1-9, 11-15, 17-19, 23-24, and 27-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto et al (EP0522758) in view of Okazaki et al. (US5389422), Tojo et al. (US5965233), and Kawai et al. (US4981897).

4. Claim 1 requires a biaxially oriented film comprising a film of a polymer alloy composed of a polyester and a thermoplastic resin, wherein the film has between 1e6-9e7/mm^2 microprotrusions having a height between 2-50nm on its surface.

5. Regarding these limitations, Yamamoto et al. (hereafter Yamamoto) teaches a surface roughened film comprising a thermoplastic polyester resin A (equivalent to

applicants claimed polyester) and a thermoplastic resin B, wherein the thermoplastic resin B has a glass transition temperature greater than that of thermoplastic polyester resin A (page 3, lines 18-25). As the thermoplastic resin B has a higher glass transition temperature than thermoplastic polyester A, resin A and resin B are logically not the same. Thus, resin B is equivalent to applicants claimed polymer 2. Specific materials for thermoplastic polymer A include polyethylene terephthalate (PET), polyethylene naphthalate (PEN) (page 4, lines 12-15). Further, Yamamoto teaches forming the composition into a biaxially oriented film (page 8, lines 50-55). Thus, Yamamoto meets all of the composition requirements of claim 1. Further, Yamamoto teaches that by biaxially orienting the film, fine irregularities (i.e. protrusions) are formed on the films surface (page 6, lines 62-37)

6. However, Yamamoto fails to teach the required density and height of protrusions required by claim 1.

7. Regarding this deficiency, Okazaki teaches a magnetic recording medium that utilizes a biaxially oriented film as a substrate (column 1, lines 60-68). Suitable materials for the substrate include PET and PEN (column 2, lines 38-50). Okazaki teaches that the mean height of the protrusions on the surface of the base film should be in the range of 20-200nm, wherein the relative standard deviation (100*(maximum height-minimum height)/mean height) of the protuberances is ≤40% in order to attain good scratch resistance and signal to noise ratio (column 7, line 60-column 8, line 2). It is important to note that for a mean height of 20nm, this relative standard deviation indicates that the difference between the maximum height and minimum height of the

protuberances is $\leq$ 8nm (calculated by setting the relative average standard deviation equal to 40%, setting the mean height to 20nm, and solving for (maximum height - minimum height)). Thus, for a mean height of 20nm, the minimum height of the protuberances cannot be below 12nm and the maximum height cannot be above 28nm, as if any protuberances are formed having heights outside this range the relative average standard deviation and mean protuberance size can not both be met.

8. Further, Tojo teaches a biaxially oriented polyester film having protrusions on its surface that is utilized as a magnetic recording film (column 3, lines 15-18). Tojo specifically teaches that the number of protrusions on the surface of the film impacts the running durability and electromagnetic conversion characteristics of the medium.. If the number of protrusions falls below $1*10^6/mm^2$, the running durability will be unsatisfactory, if the number of protrusions is above $1*10^8/mm^2$, the electromagnetic conversion characteristics are adversely affected (column 8, lines 33-41). $3*10^6$-$3*10^7$ protrusions/mm^2 is a particularly preferred number of protrusions (column 8, lines 35-41)

9. Finally, Kawai teaches that the it is known in the art of thin films that the number and density of protrusions formed on the surface of the film can be controlled by the biaxial or monoaxial orientation of the film (column 1, lines 25-40).

10. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to form $3*10^6$-$3*10^7$ protrusions/mm^2 (as taught by Tojo), having a mean height of 20nm with a relative average standard deviation of the protuberance height of less than 40% (as taught by Okazaki) on the surface of the base film of Yamamoto by controlling the orientation of the film (as taught by Kawai).

11. One would have been motivated to make this modification in light of the teaching in Tojo that a base film having $3*10^6$-$3*10^7$ has desirable electromagnetic conversion and running durability characteristics, the teaching in Okazaki that a base film which has protrusions with a mean height of 20nm and a standard deviation of protuberance height ≤40% exhibits improved signal to noise ratio, and the teaching in Kawai that the height and number of protrusions on a film can be controlled by controlling the orientation of the film. Further, one would be motivated by the fact that Yamamoto teaches a magnetic recording medium which utilizes a base film that can be made of the same materials (PET or PEN) as the base films disclosed by Tojo, Okazaki, and Kawai, and teaches that by biaxially orienting the film, fine irregularities are formed on the surface of the film.

12. The limitations of claim 2 require 3e6-6e7 protrusions/mm^2 on the surface of the film. This limitation is met as set forth above for claim 1.

13. Regarding the limitations of claim 3, and 32 wherein the applicant requires the height of the protrusions to be in the range of 2-30nm. This limitation is met as set forth above, as protrusions having a mean height of 20nm with a relative average standard deviation of protrusion height ≤40% are formed on the surface of the base film utilized by Yamamota as modified by Okazaki, Tojo, and Kawai. This range meets applicants claim 3 requirements as set forth above at section 7 above.

14. Claims 4 and 5 require at least some of the microprotrusions, more specifically 30% or more of the microprotrusions to be formed from polymer 1 or polymer 2. Regarding these limitations, Yamamoto teaches that the protuberances are cored with

the thermoplastic resin b (polymer 2) (page 4, lines 38-40). Although Yamamoto doesn't specifically teach applicants required 30%, the examiner takes the position that this limitation is met, as from the language of Yamamoto it is logical to believe that most if not all of the protuberances are cored from polymer b. Thus, these limitations are met.

15. Claim 6 requires the polymer 2 to have a glass transition temperature greater then polymer 1. Yamamoto specifically teaches this limitation at page 3, lines 18-25. Thus, this limitation is met.

16. Claims 7 and 8 require polymer 2 to be compatible with polymer 1 (claim 7), and to be specifically selected from thermoplastic polyimide, polysulfone, and polyethersulfone (claim 8). Yamamoto et al. teaches that the thermoplastic polyester A is selected from PET, PEN, PCT, and PEOB resins (page 4, lines 12-23).

17. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to use PET as the thermoplastic polyester A, as it is taught to be equivalent to the other materials listed as suitable.

18. Further, Yamamoto et al. teaches that the thermoplastic polymer B is selected from polystyrene, polymethyl methacrylate, polycarbonate, polyarylate, polyethersulfone, maleimide, and others (page 5, lines 13-15)

19. Therefore it would have been obvious to one of ordinary skill in the art to utilize polyethersulfone as the thermoplastic polymer B, as it is taught to be equivalent to the other materials listed as suitable for this purpose.

20. It is noted that the applicant lists polyethersulfone, polyimide, and polysulfone as suitable polymers that are compatible with polyethylene terephthalate on page 9 of the

instant specification. Thus, the examiner takes the position that the limitations of claims 7 and 8 are met when PET and polyethersulfone are utilized. It is further noted that example 30 of Yamamoto specifically teaches a film composition utilizing a polyimide (maleimide) and PET, which is also listed in the instant specification as a compatible mixture.

21. Claim 9 requires the polymer 2 to comprise a polyimide. Yamamoto et al. cites maleimide (a known polyimide) in a list of suitable resins for polymer B, as stated above for claims 7-8.

22. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select maleimide as polymer B of Yamamoto et al., as it is taught to be equivalent to the other resins listed.

23. Thus, as maleimide is a known polyimide, the limitations of claim 9 are met when this polymer is selected as polymer b in Yamamoto et al.

24. Claim 11 requires polymer 1 to comprise PET. This limitation is met as set forth above for claims 7 and 8.

25. Claims 12-13 require the number of protrusions having a height of 50nm or more to be 3000/mm^2 or less (claim 12), more specifically where the number of protrusions having a height >30nm is 1500/mm^2 or less (claim 13). These limitations are met as set forth above for claim 1, as the combination of the Yamamoto as modified by Okazaki, Tojo, and Kawai has protrusions with a mean height of 20nm and a relative standard deviation of the height ≤40% formed on the surface. The film of Yamamoto as modified

by Okazaki, Tojo, and Kawai meets the requirements of claims 12-13 for the reasons set forth at section 7 of this office action.

26. Claim 14 requires the film of claim 1 to be laminated as at least one outermost layer of a base layer. Yamamoto specifically teaches an embodiment wherein the film as described above for claim 1 is formed on one or both sides of a base layer (page 3, lines 29-35). Thus, this limitation is met.

27. Claim 15 requires the laminated film of claim 14 to further have a third layer formed on the opposite side of the base layer, forming a structure having an A layer (film of claim 1), B layer (base layer), and C layer. Yamamoto teaches a specific embodiment where a base layer of PET (equivalent to applicants B layer) is sandwiched between two mixed resin layers (equivalent to applicants A and C layers), which are made of a mixture of polyethylene terephthalate and maleimide resin (page 24, example 30). Thus, the limitations of claim 15 are met.

28. Claims 17, 31 and 32 require the base layer to comprises polymer 1 or a mixture of polymer 1 and polymer 2 as essential components, more specifically where the base layer and the A layer both comprise polyester (claim 31) or the same material (claim 32). These limitations are met as set forth above for claim 15, as example 30 of Yamamoto clearly utilizes PET as polymer 1 in the outer layers and as the only component in the base layer. Thus, the limitations of claims 17, 31, and 32 are met.

29. Claims 18 and 19 require essentially the same limitations as claims 12 and 13, only in a three-layer film. These limitations are met as set forth above for claims 12-15.

30. Claims 23 and 24 require the A layer to contain 0.001-2% by weight of inert particles having an average particle diameter of 0.01-2μ (claim 23), more specifically 0.01-1% by weight particles having a diameter between 0.01-1μ. Yamamoto teaches adding 0.0001-0.1 % by weight of inert particles that have an average diameter between 0.2-4μ to the polymer composition making up the "A" layer in Yamamoto (page 3, lines 29-35). Thus, as 0.1% by weight and 0.2μ are encompassed by applicant's ranges, the limitations of claims 23 and 24 are met.

31. Claims 27-29 require a magnetic layer to be laminated on one side of the polymer base film of claim 1 (claim 27), more specifically a ferromagnetic metal thin film (claim 28) or a magnetic layer comprising ferromagnetic particles in a binder (claim 29). As set forth above, Yamamoto teaches that the biaxially oriented film is suitable for use as a magnetic recording medium. Tojo establishes that the use of ferromagnetic thin film magnetic layers and magnetic layers comprising ferromagnetic particles in a binder are known to be suitably deposited on non-magnetic thin film substrates (see column 1, lines 35-45).

32. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to form a ferromagnetic thin film or a magnetic layer made of ferromagnetic particles in a binder as taught by Tojo on the surface of the biaxially oriented film taught by Yamamoto.

33. One would have been motivated to make this modification in lieu of the fact that Yamamoto explicitly states that the biaxially oriented thin film is suitable for use as a substrate for a magnetic recording medium, and the fact that Tojo teaches that

ferromagnetic thin films and magnetic layers containing ferromagnetic particles in a binder are known to be suitable magnetic recording layers that are conventionally deposited on thin film non-magnetic substrates.

34. Claims 1-6, 11, 14-15, 17, 20-22, 27, and 31-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shinonome et al. (EP0398075) in view of Okazaki, Tojo, and Kawai.

35. With respect to the limitations of claims 1-3, Shinonome et al. (hereafter Shinonome) teaches a biaxially oriented polymer film that comprises a thermoplastic polyester A (equivalent to applicants claimed polymer 1), and a thermoplastic polyamide B (equivalent to applicants claimed polymer 2) (page 3, lines 1-5). Suitable materials for thermoplastic polyester A include PET and PEN 9page 3, lines 8-10). Further, the film is biaxially oriented (page 4, lines 10-25). When formed into an oriented film, protuberances are exhibited on the surface of the film. Shinonome teaches that the the film is suitable for use as a base for magnetic recording film (column 3, lines 45-55).

Shinonome fails teach that $1*10^6$-$9*10^7$, more specifically $3*10^6$-$6*10^7$ protrusions having a height of 2-30nm are formed on the surface of the substrate, as required by claims 1-3.

36. However, Okazaki teaches a magnetic recording medium that utilizes a biaxially oriented film as a substrate (column 1, lines 60-68). Suitable materials for the substrate include PET and PEN (column 2, lines 38-50). Okazaki teaches that the mean height of the protrusions on the surface of the base film should be in the range of 20-200nm,

wherein the relative standard deviation (100*(maximum height-minimum height)/mean height) of the protuberances is $\leq$40% in order to attain good scratch resistance and signal to noise ratio (column 7, line 60-column 8, line 2). It is important to note that for a mean height of 20nm, this relative standard deviation indicates that the difference between the maximum height and minimum height of the protuberances is $\leq$ 8nm (calculated by setting the relative average standard deviation equal to 40%, setting the mean height to 20nm, and solving for (maximum height - minimum height)). Thus, for a mean height of 20nm, the minimum height of the protuberances cannot be below 12nm and the maximum height cannot be above 28nm, as if any protuberances are formed having heights outside this range the relative average standard deviation and mean protuberance size can not both be met.

37. Further, Tojo teaches a biaxially oriented polyester film having protrusions on its surface that is utilized as a magnetic recording film (column 3, lines 15-18). Tojo specifically teaches that the number of protrusions on the surface of the film impacts the running durability and electromagnetic conversion characteristics of the medium.. If the number of protrusions falls below $1*10^6/mm^2$, the running durability will be unsatisfactory, if the number of protrusions is above $1*10^8/mm^2$, the electromagnetic conversion characteristics are adversely affected (column 8, lines 33-41). $3*10^6$-$3*10^7$ protrusions/mm^2 is a particularly preferred number of protrusions (column 8, lines 35-41)

38. Finally, Kawai teaches that the it is known in the art of thin films that the number and density of protrusions formed on the surface of the film can be controlled by the biaxial or monoaxial orientation of the film (column 1, lines 25-40).

39. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to form $3*10^6$-$3*10^7$ protrusions/mm^2 (as taught by Tojo), having a mean height of 20nm with a relative average standard deviation of the protuberance height of less than 40% (as taught by Okazaki) on the surface of the base film of Shinonome by controlling the orientation of the film (as taught by Kawai).

40. One would have been motivated to make this modification in light of the teaching in Tojo that a base film having $3*10^6$-$3*10^7$ has desirable electromagnetic conversion and running durability characteristics, the teaching in Okazaki that a base film which has protrusions with a mean height of 20nm and a standard deviation of protuberance height ≤40% exhibits improved signal to noise ratio, and the teaching in Kawai that the height and number of protrusions on a film can be controlled by controlling the orientation of the film. Further, one would be motivated by the fact that Shinonome teaches a film that is suitable for a magnetic recording medium that utilizes a base film that can be made of the same materials (PET or PEN) as the base films disclosed by Tojo, Okazaki, and Kawai, and teaches that the film is preferably biaxially oriented.

41. Regarding claims 4-5, Shinonome specifically teaches that the protuberances are cored by polymer 2 (page 3, lines 1-5). Thus, the limitations of claims 4 and 5 are met.

42. Regarding claim 6, Shinonome specifically teaches that the thermoplastic polyamide has a higher Tg than the thermoplastic polyester (page 3, lines 17-19). Thus, this limitation is met.

43. Regarding claim 11, Shinonome specifically teaches the use of PET as the thermoplastic polyester. Thus, this limitation is met.

44. Regarding claims 14-15, Shinonome teaches forming a multiplayer structure wherein a film comprising the composition stated above for claim 1 is laminated on one or both sides of a second film to form an AB or ABA structure. As written, claim 15 is open to layer A and layer C being the same material. Thus, the limitations of claims 14 and 15 are met (page 4 lines 4-10).

45. Regarding claims 17 and 31-32, Shinonome teaches that the base layer of the multilayer system can be made of PET, which is the same as polymer 1 utilized in the coating layer (page 4 lines 4-10). Thus, the limitations of claims 17 and 31-32 are met.

46. Regarding claims 20-21, wherein the applicant requires a specific amounts of polymer 2 in layer A and Layer B. Page 4, lines 4-10 establish that the base of the AB or ABA structure of Shinonome does not contain any thermoplastic polyamide. Thus, Wb is 0. Further, Shinonome teaches that the amount of thermoplastic polyamide B in the coating layer (A layer) impacts the surface roughness of the layer, wherein as the amount of thermoplastic polyamide is increased, the surface roughness of the film increases, and vice versa. Thus, the examiner takes the position that the amount of thermoplastic polyamide B in the film of Shinonome is a results effective variable.

47. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to change the amount of thermoplastic polyamide in the coating layer of Shinonome in order to achieve a film having a desired surface roughness.

48. Regarding claim 22, Shinonome teaches that inert filer such as Kaolin "may" be incorporated into the coating layer. Thus, it is clear that inert fillers are not included in

the coating layer in the most basic embodiment of Shinonome. Therefore the limitations of claim 22 are met.

49. Regarding claim 27, Shinonome specifically teaches the use of the polyester film as a base material for a magnetic tape (page 2, lines 1-3).

50. Therefore it would have been obvious to one of ordinary skill in the art at time the invention was made to form a magnetic layer over the polyester film taught by Shinonome et al. as magnetic tapes comprising a polymer film substrate and a magnetic layer formed over the polymer film substrate are well known in the art.

51. Claims 1-3, 9-10, 14-16, and 25-28 rejected under 35 U.S.C. 103(a) as being unpatentable over Kinoshita et al. (US5527594) in view of Okazaki, Tojo, and Kawai.

52. With respect to claims 1-3, Kinoshita et al. (hereafter Kinoshita) teaches an optical tape that comprises a polyester film substrate, a coating layer (A layer) formed on one side of the substrate, and a coating layer (b layer) formed on the opposite side of the substrate (column 2, lines 40-52). The film is used as a base for magneto optic recording media (column 24, lines 18-25). The coating layer A is composed of a resin binder and a lubricant (column 4, lines 32-33). Suitable lubricants include vertical protuberance forming resins such as polyamide, polyacrylate, polysulfone, etc... (column 4, lines 40-50). Suitable resin binders include polyesters (column 5, lines 43-50 and column 6, lines 7-17). The film is biaxially stretched (column 7, lines 53-67), and protuberances are formed on its surface (column 5, lines 17-29). In addition, Kinoshita teaches that various additive resins may be incorporated into the A layer so as to

prevent oligomer deposition. A suitable additive polymer includes poly-ether imide (column 15, lines 32-38 and column 17, lines 17-21)

53. Kinoshita fails to teach the number, height and density of protuberances required by claims 1-3.

54. However, Okazaki teaches a magnetic recording medium that utilizes a biaxially oriented film as a substrate (column 1, lines 60-68). Suitable materials for the substrate include polyesters (column 2, lines 38-50). Okazaki teaches that the mean height of the protrusions on the surface of the base film should be in the range of 20-200nm, wherein the relative standard deviation (100*(maximum height-minimum height)/mean height) of the protuberances is ≤40% in order to attain good scratch resistance and signal to noise ratio (column 7, line 60-column 8, line 2). It is important to note that for a mean height of 20nm, this relative standard deviation indicates that the difference between the maximum height and minimum height of the protuberances is ≤ 8nm (calculated by setting the relative average standard deviation equal to 40%, setting the mean height to 20nm, and solving for (maximum height - minimum height)). Thus, for a mean height of 20nm, the minimum height of the protuberances cannot be below 12nm and the maximum height cannot be above 28nm, as if any protuberances are formed having heights outside this range the relative average standard deviation and mean protuberance size can not both be met.

55. Further, Tojo teaches a biaxially oriented polyester film having protrusions on its surface that is utilized as a magnetic recording film (column 3, lines 15-18). Tojo specifically teaches that the number of protrusions on the surface of the film impacts the

running durability and electromagnetic conversion characteristics of the medium. If the number of protrusions falls below $1*10^6/mm^2$, the running durability will be unsatisfactory, if the number of protrusions is above $1*10^8/mm^2$, the electromagnetic conversion characteristics are adversely affected (column 8, lines 33-41). $3*10^6$-$3*10^7$ protrusions/mm^2 is a particularly preferred number of protrusions (column 8, lines 35-41)

56. Finally, Kawai teaches that the it is known in the art of thin films that the number and density of protrusions formed on the surface of the film can be controlled by the biaxial or monoaxial orientation of the film (column 1, lines 25-40).

57. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to form $3*10^6$-$3*10^7$ protrusions/mm^2 (as taught by Tojo), having a mean height of 20nm with a relative average standard deviation of the protuberance height of less than 40% (as taught by Okazaki) on the surface of the base film of Kinoshita by controlling the orientation of the film (as taught by Kawai).

58. One would have been motivated to make this modification in light of the teaching in Tojo that a base film having $3*10^6$-$3*10^7$ has desirable electromagnetic conversion and running durability characteristics, the teaching in Okazaki that a base film which has protrusions with a mean height of 20nm and a standard deviation of protuberance height ≤40% exhibits improved signal to noise ratio, and the teaching in Kawai that the height and number of protrusions on a film can be controlled by controlling the orientation of the film. Further, one would be motivated by the fact that Kinososhita teaches a film that is suitable for a recording medium and utilizes a base film that can

be made of the same materials polyesters as the base films disclosed by Tojo, Okazaki, and Kawai, and teaches that the film is preferably biaxially oriented.

59. Regarding the combination of Kinsohita with Okazaki, and Tojo. The examiner acknowledges that Kinoshita is directed to a fundamentally different type of recording medium (magneto-optical recording medium) then the mediums taught Okazaki, and Tojo (magnetic recording medium utilizing non magneto optical recording layers). While one of ordinary skill in the art would clearly recognize that the recording layers of Okazaki, and Tojo are fundamentally different then the recording layers of Kinoshita, one of ordinary skill in the art of recording media would know that the film substrates for use in magneto-optical media can be substantially identical to those utilized by magnetic recording media utilizing ferromagnetic thin film recording layers. This is evidence by the fact that Kinoshita utilizes a biaxially oriented polyester film (see column 4, lines 1-22) as a substrate for a magneto-optical media substrate, and the fact that both Okazaki and Tojo teach magnetic recording media substrates that are can be biaxially oriented polyester films (as discussed above). Thus, one of ordinary skill in the art would have been motivated with a reasonable expectation of success in modifying Kinoshita per the teachings of Okazaki, Tojo, and Kawai.

60. Regarding the limitations of claims 9-10, Kinoshita teaches that various additive resins may be incorporated into the A layer so as to prevent oligomer deposition. A suitable additive polymer include poly-ether imide (column 15, lines 32-38 and column 17, lines 17-21)

61. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to include polyether imide into the coating composition A of Kinoshita et al. as polyether imide is taught to be equivalent to the other resins listed as suitable for use as an oligomer deposition prevention agent.

62. Regarding claims 14-16, wherein the applicant requires a 3 layer laminate comprising the coating of claim 1 (a layer) on at least on side of a base layer (b layer), and a C layer formed on the opposite side of the base layer then the A layer, wherein the A layer side has a surface roughness of 0.2-10nm, and the surface roughness on the C layer side is 1-30nm. Kinoshita teaches a 3 layer laminate comprising a base layer, the A layer as described above for claim 1 on one side of the base layer, and a second layer (equivalent to applicants C layer) on the opposite side of the base layer (column 13, lines 50-60, column 2, lines 40-50). The surface roughness on the a layer side is 0.005-0.5μ, and the surface roughness on the opposite side is ≤0.005μ (column 4, lines 30-39, column 13, lines 14-17). Thus, when the A layer has a surface roughness of 0.005μ, the limitations of claims 14-16 are met.

63. Regarding claims 25-26, the examiner interprets the term "composed" in claim 25 as open language that allows for other components aside from polyester and polyether imide to be present in the film, as it has not yet been established on the record that this terminology is intended to be closed. Thus, in light of this interpretation, the limitations of claims 25-26 are met as set forth above for claims 1, 9 and 16 above.

64. Regarding claims 27-28, wherein the applicant requires a magnetic layer formed on the surface of the film of claim 25, more specifically a ferromagnetic thin film. The

examiner interprets the language of claims 27-28 to be open to any kind of ferromagnetic thin film. Kinoshita teaches forming a magneto optic layer on the surface of the 3 layer substrate described above for claim 1, 16, and 25. Specifically a layer of a magneto optic material such as GdFeCo or other material is formed on the substrate surface (column 25, lines 3-7). As GdFeCo is a known ferromagnetic material, these limitations are met.

Response to Arguments

65. Applicant's arguments with respect to the rejection of claims 1-32 as set forth in the office action dated 3/21/03 have been considered. However, these arguments have been rendered moot in lieu of the new grounds of rejection cited above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nikolas J. Uhlir whose telephone number is 703-305-0179. The examiner can normally be reached on Mon-Fri 7:30 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Thibodeau can be reached on 703-308-2367. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-0389.

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11/5/03

Paul Thibodeau
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